REMARKS

This application has been carefully reviewed in light of the Office Action mailed on May 15, 2009. Applicant respectfully requests consideration of the foregoing amendment in light of the following remarks.

Summary of the Office Action

In the Office Action of May, 2009, claims 1-2 and 16-17 were rejected under 35 U.S.C. 112, second paragraph, as allegedly being indefinite. Claim 18 was rejected under 35 U.S.C. 102(e) as allegedly being anticipated by U.S. Patent Application Publication No. 2003/0072685 to Goldman et al (hereinafter referred to as "Goldman"). Claims 1-2 and 16-17 were rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Goldman in view of U.S. Patent No. 5,364,790 to Atwood et al (hereinafter referred to as "Atwood"). No other issues were raised.

Status of the Application

Upon entry of the present amendment, claims 1 and 18 will have been amended. Accordingly, claims 1-2, 4-11 and 16-18 remain pending in the application, with claims 4-11 being withdrawn as drawn to a non-elected invention.

Rejection of Claims 1-2 and 16-17 under 35 U.S.C. 112, Second Paragraph

Claims 1-2 and 16-17 were rejected under 35 U.S.C. 112, second paragraph, as allegedly being indefinite (*see, e.g.,* pages 2-3 of Office Action). This rejection is respectfully traversed.

In particular, Claim 1 was rejected because the recitation "a nucleic acid probe immobilized in an array on a surface of the substrate" as in the claim was deemed confusing, because "an array, by definition comprises multiple elements. However, the claim is drawn to one probe" (Office Action page 2). Accordingly, claim 1 is being amended herewith to recite "a nucleic acid probe array substrate having nucleic acid *probes* immobilized in an array on a surface of the substrate" (emphasis added), and thus the claim as amended now recites the nucleic acid probe array substrate having plural nucleic acid probes. Claim 1 as amended is thus believed to meet the requirements of 35 U.S.C. 112, second paragraph. Claims 2 and 16-17 depend from claim 1, and thus also meet the requirements of 35 U.S.C. 112, second paragraph, because the recitation of "said probes" therein has proper antecedent basis in amended claim 1.

Accordingly, the rejection of claims 1-2 and 16-17 under 35 U.S.C. 112, second paragraph, is respectfully requested to be withdrawn.

Rejection of Claim 18 under 35 U.S.C. 102(e) over Goldman

Claim 18 was rejected under 35 U.S.C. 102(e) as allegedly being anticipated by Goldman (*see, e.g.,* pages 3-4 of Office Action). This rejection is respectfully traversed.

Claim 18 is not anticipated by Goldman, because Goldman does not teach a heat conduction adapter as claimed, for using a heater with a plurality of holes for microtubes in temperature control for a nucleic acid probe array substrate, the heat conduction adapter comprising:

"a face provided with a plurality of legs having the same shape as that of the microtubes, and

another face being flat and having no recesses for contacting with a face of the nucleic acid probe array substrate or a cover forming a chamber with the nucleic acid probe array substrate,

wherein the plurality of legs on the face of the heat conduction adapter are fitted into the plurality of holes of the heat conduction adapter, thus bringing the heater into thermal contact with the nucleic acid probe array" (emphasis added).

In particular Goldman does not teach a heat conduction adapter *having a face that is flat and that has no recesses*, as in the claim, and that contacts a face of the nucleic acid probe array substrate or a cover that forms a chamber with the nucleic acid probe array substrate (*see, e.g.,* Figs. 1-2 and 5 of instant application). Such a heat conduction adapter may be capable of relatively efficiently conducting heat to and from a substrate placed thereon.

Instead, Goldman teaches a sample block having a top plate 100 that "includes one or more recesses 102 into which reaction sample vessels (not shown) may be inserted. The recesses define downwardly projecting features ("projections") 104" (paragraph [0020]). The recesses 102 formed in the top surface of the top plate 11 can further be seen by viewing Figs. 1 and 2 of Goldman. Accordingly, Goldman teaches a top plate having recesses, and thus does not teach heat conduction adapter *having a face that is flat and has no recesses*, as recited in the claim.

As Goldman does not teach the heat conduction adapter as claimed having the flat face with no recesses, it is considered that Goldman does not anticipate the claim, and thus the rejection of claim 18 under 35 U.S.C. 102(e) over Goldman is respectfully requested to be withdrawn.

Rejection of Claims 1-2 and 16-17 under 35 U.S.C. 103(a) over Goldman and Atwood

Claims 1-2 and 16-17 were rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Goldman in view of Atwood (*see, e.g.,* pages 4-6 of Office Action). This rejection is respectfully traversed.

Claim 1 is not obvious over Goldman and Atwood because neither of the references teaches or suggests a system for reaction of a nucleic acid comprising:

"a reaction unit comprising:

a nucleic acid probe array substrate having nucleic acid probes immobilized in an array on a surface of the substrate:

a cover member for forming a chamber with said probes immobilized on said surface, wherein a liquid can be filled into the chamber so as to apply said liquid to each of said probes;

a heat conduction member for improving thermal diffusion in the liquid within said chamber, the heat conduction member being in contact with said substrate or said cover member with *their contacting surfaces being flat and having no recesses*; and

a temperature control block for controlling the temperature of said heat conduction member,

wherein said temperature control block includes a plurality of holes at a contact portion for inserting microtubes thereinto, and

wherein said heat conduction member being for filling the plurality of holes at the contact portion of said temperature control block including a plurality of legs and each of the plurality of legs of said heat conduction member is adapted to be inserted into and in close contact with each one of the plurality of holes at the contact portion of said temperature control block, which is located on a back surface of said substrate, and the temperature control block being in contact with said substrate or said cover member" (emphasis added).

Instead, similarly to the discussion provided for claim 18 above, Goldman does not teach or suggest a heat conduction member *having a contacting surface that is flat and has no recesses*, and that contacts a nucleic acid probe array substrate, as recited in the claim (*see, e.g.,* Figs. 1-2 and 5 of instant

application). Such a heat conduction member may be capable of relatively efficiently conducting heat to and from a substrate placed thereon.

In contrast, Goldman teaches a sample block having a top plate 100 that "includes one or more recesses 102 into which reaction sample vessels (not shown) may be inserted. The recesses define downwardly projecting features ("projections") 104" (paragraph [0020]). The recesses 102 formed in the top surface of the top plate 11 can further be seen by viewing Figs. 1 and 2 of Goldman. Accordingly, Goldman teaches a top plate having recesses, and thus does not teach the heat conduction member *having a contacting surface that is flat and has no recesses*, as recited in the claim.

Moreover, it is considered that one of ordinary skill in the art would not have found it obvious, based on the teachings of Goldman, to devise the claimed system having the heat conduction member with the contacting surface that is flat and *has no recesses*. This is at least in part because Goldman teaches that the recesses are provided in the top plate 100 of the sample block for the purpose of *receiving reaction sample vessels* (*see, e.g.,* paragraph [0020]), for example to provide heating or cooling of samples in the sample vessels held in the sample block, such as in PCR thermal cycling processes or other biological molecular processes (*see, e.g.,* paragraphs [0001]-[0004]). Accordingly, one of ordinary skill in the art would not have found it obvious to provide a flat contacting surface that has no recesses in the sample block of Goldman, because it would be understood that failing to provide such recesses would actually *subvert the intended purpose* of the sample block of Goldman, by eliminating the means by which sample vessels can be received in the sample block, thereby rendering the sample block unsuitable for its intended use.

It is furthermore noted that Goldman does not teach or suggest any of the advantages associated with the claimed system having the heat conduction member with the contacting surface that is flat and has no recesses. For

example, Goldman does not teach or suggest any advantages in terms of the increase in the efficiency in heat conduction to and from a substrate placed the heat conduction member. Instead, the top plate 100 of Goldman can be seen to have a plurality of recesses, and air having poor heat conductivity would be present in such recesses. The presence of the recesses would thus also result in reduced contact area between the top plate (100) and a substrate placed thereon, thereby reducing the efficiency of heat transfer between the top plate 100 and the substrate.

Atwood does not make up for the deficiencies of Goldman. Instead, in the section referred to in the Office Action (*see, e.g.,* pages 5-6 of Office Action), Atwood teaches providing an adapter plate 110 that has "a flat bottom surface **112** and a top surface **114** which has spaced parallel grooves" (column 14, lines 66-68), where "the flat surface portion **118** between the grooves **116** fully contacts the glass surface of the slide **14** placed on the adapter plate" (column 15, lines 1-3). Thus, Atwood teaches an adapter plate 110 *having a top surface 114 with grooves 116* therein (i.e., a type of recess), but Atwood does not teach or suggest providing a heat conduction member *having a contacting surface that is flat and has no recesses*, as in the system as claimed.

Accordingly, as neither Goldman nor Atwood teach or suggest a system having the heat conduction member as claimed, it is considered that claim 1 is patentable over the references. Claims 2 and 16-17 depend from claim 1, and thus are also patentable over the cited references for at least the same reasons as their base claim.

The rejection of claims 1-2 and 16-17 under 35 U.S.C. 103(a) over Goldman and Atwood is, therefore, respectfully requested to be withdrawn.

CONCLUSION

Applicant respectfully submits that all of the claims pending in the application meet the requirements for patentability, and respectfully requests that the Examiner indicate the allowance of such claims. Any amendments to the claims which have been made in this response which have not been specifically noted to overcome a rejection based upon prior art, should be considered to have been made for a purpose unrelated to patentability, and no estoppel should be deemed to attach thereto.

If any additional fee is required, please charge Deposit Account Number 502456. Should the Examiner have any questions, the Examiner may contact Applicant's representative at the telephone number below.

Respectfully submitted,

8/31/2009

Date

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